

based on functional value, the functions of the various tissues and organs being discussed as an introduction to their intimate structure. The scope is necessarily a very wide one, and as a consequence the description of detail is in many cases limited, and in some cases tends to obscurity.

The authors confine their aim to general principles which shall serve as a broad foundation for further studies (*vide* preface). The treatise, however, is better adapted as a reference book for the more advanced student who has already some acquaintance with histological detail than as a guide to one commencing its study.

Although the function of the structure is the key-plan of the work, insufficient force is given to the mutual interdependence of the two, the significance of a structure as a functional adaptation being frequently lost sight of. The statement in the preface that "all structures exist only for the purpose of performing certain functions in some particular way" is dangerous and open to misinterpretation, while the statement in the text (p. 185) that nerve cells of a size beyond a definite limit "are obliged to develop in their cytoplasm a set of channels that will serve to increase the power of nutritive exchange" is open to more than criticism, and is misleading to a degree.

The various theories as to the intimate structure of protoplasm are fairly well given, but it is not made sufficiently clear that the hypothetical structure of protoplasm is largely founded on the examination of dead tissue, and that the appearances presented by tissues which have been treated by hardening and staining reagents may give a very inadequate picture of living matter.

Electrical and light-producing organs are dealt with in chapters replete with instruction and teeming with interest, but the treatment of gas and heat production is not so satisfactory. It is not sufficiently insisted upon that the production of heat is a necessary concomitant of most metabolic processes, while it is pushing the processes of *secretion* too far to suggest that heat is to be regarded as the outcome of certain specialised granules for which the term "thermochondria" is proposed (p. 141), or that the gas which fills the swim-bladder of a teleost fish first appears in special gas-secreting cells in the form of granules (p. 334).

Chondrostosis involves a bewildering succession of complicated changes, a convincing account of which has yet to be written. A perusal of its description in the work under notice (p. 70) will not bring confused ideas into order. The changes taking place are described as a *transformation* of hyaline cartilage into bone, that the process is fundamentally neoplastic not being recognised. The statement that "when ossification begins a vascular loop enters the bone bringing with it the various bone-making cells" endows the blood-vessel with a potency of active migration which it certainly does not possess; the so-called vascularisation of the cartilage certainly involves an active migration of cellular tissue, but the vessels which appear therein undoubtedly develop *in situ*. A description of the intermediate stage, the forma-

tion of a temporary metaplastic bone represented by the calcification of the cartilage, is omitted, the deposition of the lime salts being entirely ascribed to the osteoblasts. That the bone formation begins in the middle of the "joint" of an embryonic finger is a novel use of the term joint; it is perhaps popularly correct, but not to be expected in a scientific text-book as a term defining a digital segment. Bone, it is stated, can be formed in the connective tissue, but no account is given of parostosis, and this omission is a serious one.

Vertebrate histology, on the whole, receives scant treatment, and this will be felt in studying the abbreviated descriptions of the retina (p. 255 *et seq.*), the organ of Corti (p. 221), and the organs of digestion (chapter xv), but the authors hint that such matters are adequately dealt with in medical text-books, and this relative deficiency is more than compensated for by such able and comprehensive contributions as the sections dealing with nephridial tissues, mechanical protection, poisonous fluids, &c.

The book is richly illustrated; the figures, for the most part in black line, are exceedingly clear and instructive, and add vastly to the value of the work as a whole. Many of the illustrations are original; others are selected from well-known sources with a wise discrimination.

The chapter on "technic" (!), although very abbreviated, gives a good practical outline of general methods of hardening and staining, but the suggestions, scattered throughout the text, as to the methods for elucidating the details of special tissues are scanty in the extreme, and of no practical value.

The whole bibliography is slender; the authors seem to have relied largely on the results of their own original research; this, however, adds greatly to the intrinsic value of the work. Typographical errors are numerous; "Haidenhain" in the text, and the titles of French and German papers quoted on pp. 166, 173, 501, &c., stand in need of correction.

With some amendments in the text, a few more details concerning the preparation of tissues for examination, and a more complete bibliography, Messrs. Dahlgren and Kepner's treatise will prove an invaluable addition to the library of the biologist.

INDIAN WILD-FOWL.

The Indian Ducks and their Allies. By E. C. Stuart Baker. Pp. xi+292; illustrated. (Bombay: Natural History Society; London: R. H. Porter, 1908.) Price 2l. 2s. net.

THE enormous flocks in which many members of the duck tribe visit the plains of India during the cold season, coupled with the relatively large number of species by which the group is there represented, affords ample justification for the issue of this handsome and superbly illustrated volume. For these swarms of ducks, geese, swans, and mergansers naturally attract the attention of a host of sportsmen, many of whom are anxious to identify the species of the birds which go to form their bag, and ascertain something about their natural history. Neither is the

book of less importance to the ornithologist—either professional or amateur for Mr. Stuart Baker has much new matter to record concerning many of the species passed under review, while the thirty coloured plates—reproduced from sketches by Messrs. Grönvold, Lodge, and Keulemans—have a distinct scientific value of their own, altogether apart from their beauty as works of art.

The origin of the book dates from 1896, when the author was asked to communicate a series of illustrated articles on Indian ducks to the Journal of the Bombay Natural History Society which should incorporate the numerous notes on the group published in the Indian scientific journals and sporting papers since the issue of Hume and Marshall's well-known "Game-birds of India." These articles were commenced in the eleventh volume of the aforesaid serial, and the work now before us is a reprint of the series, with such additions and emendations as were necessary to bring them up to date.

Apart from the flamingoes, which are brigaded with the ducks under the general title of "Chenomorphæ," the author recognises no fewer than forty-three representatives of the group as visiting or permanently residing in India. He is, however, somewhat of a "splitter," and certain of his species, as in the goose-section, would very probably be relegated to a lower grade by many naturalists. We are also inclined to disagree with his views as to the multiplication of generic groups. The division of the flamingoes into two genera, and likewise the splitting of the brent-geese into *Rufibrenta* and *Branta*, are examples of what appears to us totally unnecessary complication in this matter. The author has, however, taken Count Salvadore's British Museum catalogue of the group as his guide, and he has adhered religiously to the classification therein adopted. We confess to a feeling that it would have been better to follow the late Dr. Blandford's volume in the "Fauna of British India," whereby greater simplicity would have been secured, and at the same time some advance made towards uniformity in the names of Indian animals. In this connection we may note the urgent need of a proper table of contents at the commencement of the volume, the one which does duty therefor being too absurd for words, two out of its half-dozen items being "title-page" and "contents," while a third is "Indian Ducks."

For a book which must be largely patronised by sportsmen (if it is to make a profit), we also venture to think that too many technical terms, or definitions, are introduced without any sort of explanation. What, for instance, will the sportsman (or, for that matter, the amateur naturalist) make of the bald statement that the *Chenomorphæ* are characterised by having the "palate desmognathous," or what will he understand by the "neotropical region"? If such expressions are used at all, they ought to be adequately explained; but in our opinion they are altogether out of place in a work of this nature; the professional naturalist does not want them, and the amateur and the sportsman do not understand them. In the place

of the former a statement to the effect that the palate in the dry skull is of the closed or bridged type, and that the difference between the bridged and the open or slit type may be realised by comparing the skull of a duck with that of a fowl, would have been much more to the point; while as regards the latter it would have been infinitely better to use the ordinary names, South and Central America, in place of neotropical region.

With these exceptions—if it be added that the author has an extremely old-fashioned and obsolete way of spelling Indian place-names—we have nothing but commendation for the volume before us, the species being clearly and carefully described, with full and well-written notices of their distribution and habits. As Mr. Baker observes, the collection and collation of a vast amount of scattered information concerning the Indian Anatidæ renders it from the first possible to know the extent of our information on the subject, and to realise what gaps require filling up. The book should be in the library of every Indian sportsman, by whom it should be taken into camp in each winter's sporting trip.

R. L.

BIOCHEMICAL MONOGRAPHS.

The Nature of Enzyme Action. By Dr. W. M. Bayliss, F.R.S. Pp. ix+90. (London: Longmans, Green and Co., 1908.) Price 3s. net.

The Chemical Constitution of the Proteins. By Dr. R. H. Aders Plimmer. In two parts. Part i., pp. xii+100; part ii., pp. xi+66. (London: Longmans, Green and Co., 1908.) Part i., 3s. net; part ii., 2s. 6d. net.

Neuere Ergebnisse auf dem Gebiete der speziellen Eiweisschemie. By Emil Abderhalden. Pp. 128. (Jena: G. Fischer, 1909.) Price 3.50 marks.

Intracellular Enzymes. A Course of Lectures given in the Physiological Laboratory, University of London. By Dr. H. M. Vernon. Pp. xi+240. (London: John Murray, 1908.) Price 7s. 6d. net.

THE number of books issued in any particular subject is not always a sure criterion of the importance of that subject. In this particular instance, however, where a shower of five monographs has suddenly fallen, not only is the interest which biochemistry is at present attracting indicated, but a perusal of the books themselves shows that they deal with a subject of supreme importance both to the chemist and to the biologist.

The first three on the list, that by Dr. Bayliss, and the two parts from the pen of Dr. Plimmer, are monographs which are being issued under the joint editorship of Dr. F. G. Hopkins, of Cambridge, and Dr. R. H. Aders Plimmer, of University College, London. To some extent the idea is similar to that underlying the issue of the "Ergebnisse der Physiologie" in Germany, only with this important difference, namely, that the individual monographs or chapters (each written by someone who is master in that particular subject) are issued independently of the others, so that if necessity arises a new edition of any